Technical Document LA25057

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY	Application number	Legal land description
☒ Approval ☐ Registration ☐ Authorization ☐ Amendment	LA25057	SW 4-10-25 W4M

APPLICATION DISCLOSURE

This information is collected under the authority of the *Agricultural Operation Practices Act* (AOPA), and is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This information is public unless the NRCB grants a written request that certain sections remain private.

Any construction prior to obtaining an NRCB permit is an offence and is subject to enforcement action, including prosecution.

I, the applicant, or applicant's agent, have read and understand the statements above, and I acknowledge that the information provided in this application is true to the best of my knowledge.

May 26/25
Date of signing

Signa [redacted] *

Henk Vanderberg
Print name

Corporate name (if applicable)

GENERAL INFORMATION REQUIREMENTS

Proposed facilities: list all proposed confined feeding operation facilities and their dimensions. Indicate whether any of the proposed facilities are additions to existing facilities. (attach additional pages if needed)

Proposed facilities	Dimensions (m) (length, width, and depth)
Feedlot Pens - west row	288 m x 77 m
- middle row	292 m x 76.2 m
- east row	292 m x 76.2 m
Catchbasin updated dimensions: 100 m x 53 m x 5 m deep) as per conversation August 13, 2025	80 m x 43 m x 5 m (deep)
Solid Manure Pad	100 m x 70 m (approx)

Existing facilities: list **ALL** existing confined feeding operation facilities and their dimensions

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Feedlot Pens (as per old permit)	320 m x 320 m (irregular shape)	

NRCB USE ONLY

Dimensions confirmed
(See LA10063)

Last updated September 11, 2023

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If a new facility is replacing an old facility, please explain what will happen to the old facility and when. ☐ **N/A**

LA 10063 allowed for the use of new feedlot pens, including a runoff filter strip. Runoff from the pens was directed to a field to the east of the feedlot.

With this application, new pens are proposed in the filter strip area. A runoff catch basin is proposed to collected runoff from the new and historic feedlot pens.

AO comment: The new feedlot pens will constructed in the area of the filter strip. No decommissioning is required

Construction completion date for proposed facilities Dec 30, 2027

Additional information

Livestock numbers: Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: if livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted livestock numbers**	**Proposed increase or decrease in number (if applicable)**	**Total**
Beef – Finishers	5000	6000	11,000
– Feeders	0	0	

(AO comment: copy from Part 1)

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE
issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)
Date and sign one of the following four options

OPTION 1: Applying through the NRCB for both the AOPA permit and the *Water Act* licence

I **DO** want my water licence application coupled to my AOPA permit application.

Signed this ____day of _____, 20____. _____
Signature of Applicant or Agent

OPTION 2: Processing the AOPA permit and *Water Act* licence separately

1. I (we) acknowledge that the CFO will need a new water licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. I (we) request that the NRCB process the AOPA application **independently of** EPA's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by EPA as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to EPA's consideration of whether to grant the *Water Act* licence application.
5. * I (we) acknowledge that any such construction or livestock populating will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.
7. **Provide:** Water licence application number(s) _____

Signed this 26 day of May, 2025. [redacted] *
Signature of Applicant or Agent

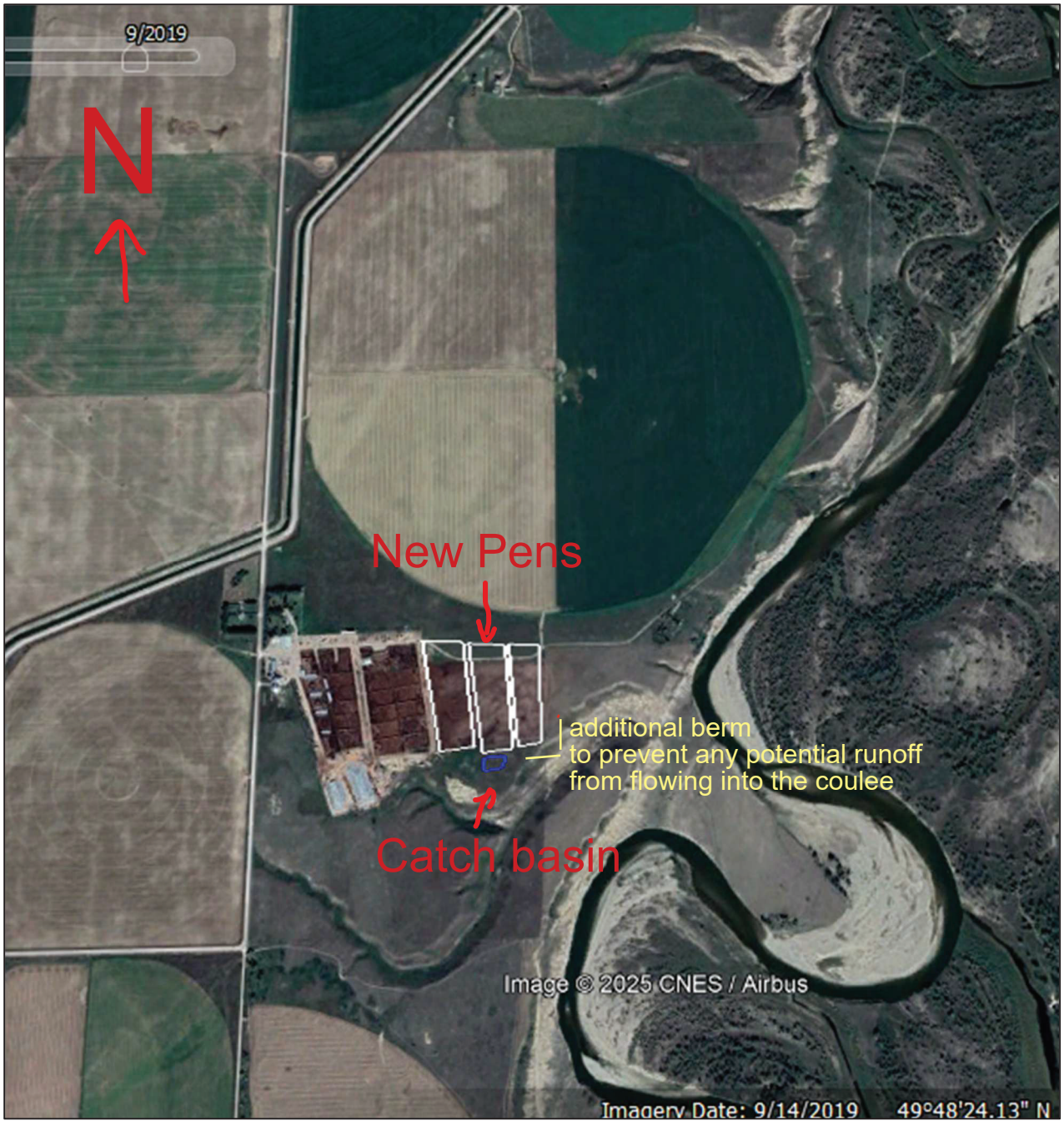
OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. **Provide**: Water license number(s) or water conveyance agreement details _____

Signed this ____ day of _____, 20____. _____
Signature of Applicant or Agent

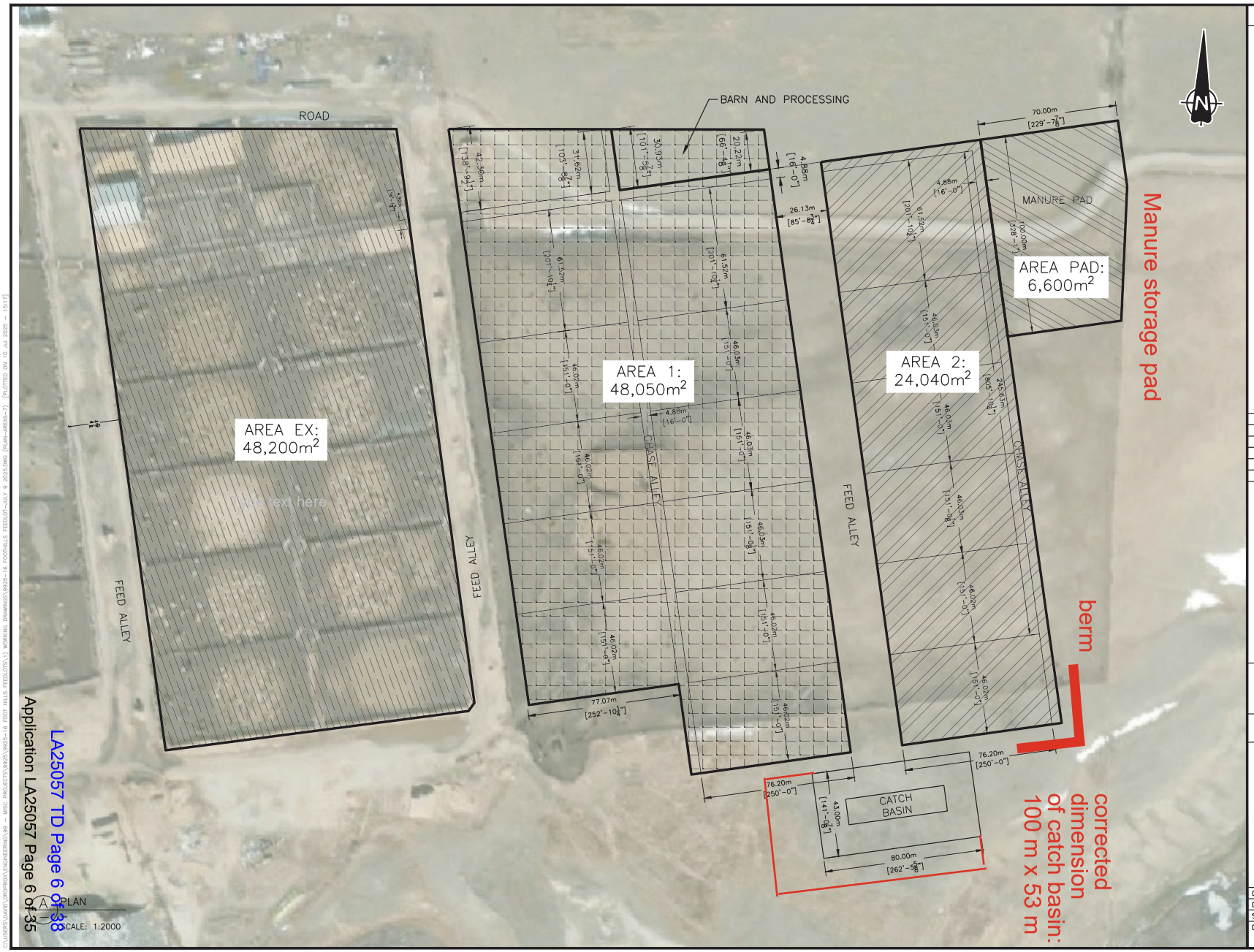
Appendix

Site Map



Area Map


Foothill Farms
811
811
3
3
Image Landsat / Copernicus
Fort Macleod



LEGEND / NOTES

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE DEPTH OF SERVICES PRIOR TO CONSTRUCTION.
2. ALL UNDERGROUND UTILITIES, INCLUDING GAS, OIL, TELUS, ELECTRICAL, MUNICIPAL WATER, ETC., AS SHOWN ON THIS PLAN, ARE BASED ON INFORMATION RECEIVED FROM THE RESPECTIVE AUTHORITIES. NO RESPONSIBILITY IS IMPLIED OR ASSUMED BY THE ENGINEER AS TO LOCATION, OR OMISSIONS. THE CONTRACTOR MUST CONTACT THE VARIOUS UTILITIES FOR ON-SITE INFORMATION AS TO ACTUAL LINE LOCATIONS PRIOR TO STARTING CONSTRUCTION.
3. IT IS THE LANDSCAPER'S RESPONSIBILITY TO ENSURE THAT RUNOFF FOLLOWS THE RECOMMENDED DRAINAGE PATHS AND NO STANDING WATER OCCURS NEAR THE RESIDENCE.

- NEW SWALE
- HORIZONTAL CULVERT
- PP — POWER POLE
- TP — TELUS PEDESTAL
- SANITARY MANHOLE-EXISTING

ALL DIAMETERS ARE IN mm UNLESS OTHERWISE SPECIFIED.

ISSUE	DATE	REVISION DESCRIPTION
2	20MAY'25	ISSUED FOR REVIEW
1	5MAY'25	ISSUED FOR REVIEW

WILDE BROTHERS
ENGINEERING LTD.
PERMIT TO PRACTICE
P08438

WILDE BROS. ENGINEERING LTD.
Raymond, Alberta

FOOTHILLS FEEDLOT

FEEDLOT ADDITION
PLAN - AREAS

DESIGNED:	DJW	CHECKED:	DJW
DRAWN:	J.L.J.	JOB:	9925-16
SCALE:	1:1800	DIMENSIONS:	METRES
DATE:	MAY 2, 2025	DRAWING No:	7

A PLAN
SCALE: 1:2000

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

GENERAL ENVIRONMENTAL INFORMATION

(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)

Facility description / name *(as indicated on site plan)*

Existing: Feedlot pens

Proposed 1: Feedlot Pen - Expansion

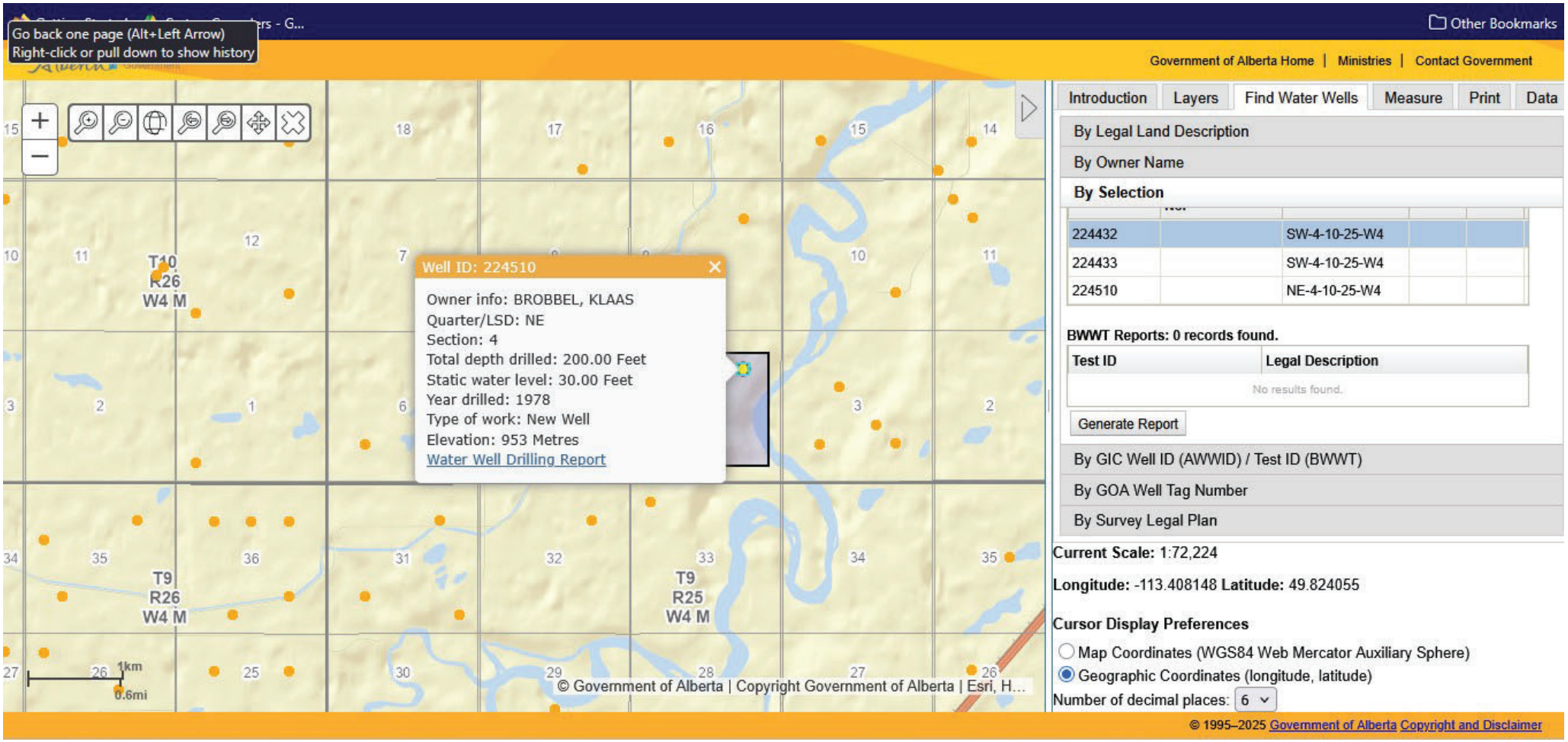
Proposed 2: Catch basin

Proposed 3: Manure storage pad

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	● >1 m ☐ ≤ 1 m	● >1 m ☐ ≤ 1 m	● >1 m ☐ ≤ 1 m	● > 1 m ☐ ≤ 1 m	☒ YES ☐ NO ☐ YES with exemption	not in known flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0	0	☒ YES ☐ NO ☐ YES with exemption	None observed during site visit or EPA database
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	0	☒ YES ☐ NO ☐ YES with exemption	None observed within 100 m of CFO facility (site visit or EPA database)
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	580m	380 m	370m	420m	☒ YES ☐ NO ☐ YES with exemption	100 m to ephemeral creek that is part of the Oldman River coulee system
Groundwater information	What is the depth to the water table?		> 5 m	> 5m	>5 m	☒ YES ☐ NO ☐ YES with exemption	below 8 m below ground (see drilling report below)
	What is the depth to the groundwater resource/aquifer you draw water from?	>10 m	> 10 m	>10 m	>10 m	☒ YES ☐ NO ☐ YES with exemption	Well 224510 Depth to UGR unknown Worst case: 4.27 m blg (*)

Additional information (attach supporting information, e.g. borehole logs, records, etc. you consider relevant to your application)

(*) The drilling done on site does not support the presence of a UGR at a depth of 4.27 m bgl. Only borehole 12 showed free water between 1.9-2.4 m. It is a lower laying area that will be filled in. No saturated layers encountered within 8 m below ground level.


Go back one page (Alt+Left Arrow)
Right-click or pull down to show history
Other Bookmarks
Government of Alberta Home | Ministries | Contact Government
Introduction
Layers
Find Water Wells
Measure
Print
Data
By Legal Land Description
By Owner Name
By Selection
224432 SW-4-10-25-W4
224433 SW-4-10-25-W4
224510 NE-4-10-25-W4
BWWT Reports: 0 records found.
Test ID
Legal Description
No results found.
Generate Report
By GIC Well ID (AWWID) / Test ID (BWWT)
By GOA Well Tag Number
By Survey Legal Plan
Well ID: 224510
Owner info: BROBBEL, KLAAS
Quarter/LSD: NE
Section: 4
Total depth drilled: 200.00 Feet
Static water level: 30.00 Feet
Year drilled: 1978
Type of work: New Well
Elevation: 953 Metres
Water Well Drilling Report
T10 R26 W4 M
T9 R26 W4 M
T9 R25 W4 M
1km
0.6mi
© Government of Alberta | Copyright Government of Alberta | Esri, H...
Current Scale: 1:72,224
Longitude: -113.408148 Latitude: 49.824055
Cursor Display Preferences
Map Coordinates (WGS84 Web Mercator Auxiliary Sphere)
Geographic Coordinates (longitude, latitude)
Number of decimal places: 6
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NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities See Decision Summary LA125057 for detail

Facility	Groundwater score	Surface water score	File number
catch basin	low	low	LA25057

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
feedlot	low	low	LA25057

ERST related comments:

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NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

The water well is not within 100 m of the CFO facilities

Well IDs: water well ID 224510 _____ _____

_____ _____ _____

Surface water related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

Groundwater related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

Water wells ☒ N/A

If applicable, exemption for 100 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Surface water ☒ N/A

If applicable, exemption for 30 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Water Well Exemption Screening Tool ☒ N/A

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

Groundwater or surface water related comments:

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DISTANCE OF ANY MANURE STORAGE FACILITY (EXISTING OR PROPOSED) TO NEIGHBOURING RESIDENCES

			NRCB USE ONLY				
Neighbour name(s)	**Legal land description**	**Distance (m)**	**Zoning (LUB) category**	**MDS category (1-4)**	**Distance (m)**	**Waiver attached (if required)**	**Meets regulations**
As per email from applicant: The houses on NE 5-10-25 NW 4-10-25, SW 9-10-25 and SE 9-10-25 are owned by applicant							
residence	NE 32-9-25 W4M	1253 m	RG	1	1253 m		yes
	SW 5-10-25 W4M	1792 m	RG	1	1792 m		yes

LAND BASE FOR MANURE AND COMPOST APPLICATION (complete only if an increase in livestock or manure production will occur)

				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone *****	**Usable area (ha)**	**Agreement attached (if required)**
See attached landbase list					
			Total	1479 acres dry brown 1275 acres irrigated	

* If you are **not** the registered landowner, you must attach copies of land use agreements signed by all landowners.

** Available manure spreading area (excluding setback areas from residences, common bodies of water, water wells, etc. as identified in Agdex 096-5 Manure Spreading Regulations)

*** Brown, dark brown, black, grey wooded, or irrigated

Additional information (attach any additional information as required)

Manure Spreading Agreement

This agreement is between:

Case Brobbel, manure producer, and

Smit Bros Farms Ltd, manure receiver

Length of agreement: This agreement is valid for a time period of 25 year(s)

Legal Land Location	Soil Type[1]	Acres suitable for manure spreading[2]
E ½ . 7 . 10 . 25	2	320
W ½ . 33 . 9 . 25	2	215
32 . 09 . 25	2	604
E ½ . 31 . 9 . 25	2	123
N ½ . 31 . 9 . 25	2	130

Dry brown

All W4
"
"
"
"

[1] Soil type choices: Dark brown and brown, grey wooded, black, and or irrigated

[2] Land within required setback from water bodies, water wells, residences, etc, is not included

Other Comments:

Manure Producer (Confided Feeding Operation) Legal Land Location: SW 4-10-25 W4

Date (dd/mm/yyyy)	Signature	Print Name	Corporate Name (if applicable)
09/07/2025	[redacted]	Case Brobbel	

Manure Receiver – Landowner(s)[3]

Date (dd/mm/yyyy)	Signature	Print Name	Corporate Name (if applicable)
09/07/2025	[redacted]	Kenneth Smit	Smit Bros. Farms Ltd

[3] All registered owners of land, or authorized signing authorities must sign

2025 Landbase for manure application

Case Brobbel Foothill Farms

Field Location	Field	Irrigation Acres	Driland Acres
SW-9-10-25-W4	1	110	20
SE-9-10-25-W4	2	108	
NW-4-10-25-W4	3	103	
NE-4-10-25-W4	4	110	5
NE-5-10-25-W4	5	90	26
SE-5-10-25-W4	6	140	18
NW-8-10-25-W4	20	152	3
SE-8-10-25-W4	21	154	3
SW-8-10-25-W4	22	154	6
SE-8-10-25-W4	23	154	6
	TOTAL	1275	87

Name	Foothill Farms
Address	
Legal Land	
Location	

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Beef	Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.4459	11,000	4,904.9
	Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.2450	-	-
	Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.1348		-
	Other						-
Dairy	*Free Stall – Lactating Cows with all associated dries, heifers, and calves	0.800	1.100	2.000	1.7600		-
(*count lactating cows only)	*Free Stall – Lactating cows with Dry Cows only	0.800	1.100	1.640	1.4432		-
	Free Stall – Lactating Cows only	0.800	1.100	1.400	1.2320		-
	Tie Stall – Lactating cows only	0.800	1.000	1.400	1.1200		-
	Loose Housing – Lactating cows only	0.800	1.000	1.400	1.1200		-
	Dry Cow (Solid manure)	0.800	0.700	1.000	0.5600		-
	Dry Cow (Liquid manure)						
	Replacements – Bred Heifers (Breeding to Calving)	0.800	0.700	0.875	0.4900		-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.2940		-
	Calves (< 350 lbs)	0.800	0.700	0.200	0.1120		-
	Other					-	-
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.9160		-
	Farrow to wean *	2.000	1.100	0.670	1.4740		-
	Farrow only *	2.000	1.100	0.530	1.1660		-
	Feeders/Boars	2.000	1.100	0.200	0.4400		-
	Growers/Roasters	2.000	1.100	0.118	0.2600		-
	Weaners	2.000	1.100	0.055	0.1210		-
	Other					-	-
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.8480		-
	Farrow to wean *	2.000	0.800	0.670	1.0720		-
	Farrow only *	2.000	0.800	0.530	0.8480		-
	Feeders/Boars	2.000	0.800	0.200	0.3200		-
	Growers/Roasters	2.000	0.800	0.118	0.1888		-
	Weaners	2.000	0.800	0.055	0.0880		-
							-
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.0070		-
	Chicken - Layers - Liquid (includes associated pullets)	2.000	1.100	0.008	0.0176		-
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.0112		-
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.0112		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.0014		-
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.0140		-
	Turkey - Hens (light)	1.000	0.700	0.013	0.0091		-
	Turkey - Broilers	1.000	0.700	0.010	0.0070		-
	Ducks	1.000	0.700	0.010	0.0070		-
	Geese	1.000	0.700	0.020	0.0140		-
	Other						-
Horses	PMU	0.650	0.700	1.000	0.4550		-
	Feeders > 750 lbs	0.650	0.700	1.000	0.4550		-
	Foals < 750 lbs	0.650	0.700	0.300	0.1365		-
	Mules	0.600	0.700	1.000	0.4200		-
	Donkeys	0.600	0.700	0.670	0.2814		-
	Other						-
Sheep	Ewes/Rams	0.600	0.700	0.200	0.0840		-
	Ewes with lambs	0.600	0.700	0.250	0.1050		-
	Lambs	0.600	0.700	0.050	0.0210		-
	Feeders	0.600	0.700	0.100	0.0420		-
	Other						-
Goats	Meat/Milk (per Ewe)	0.700	0.700	0.170	0.0833		-
	Nannies/Billies	0.700	0.700	0.140	0.0686		-
	Feeders	0.700	0.700	0.077	0.0377		-
	Other						-
Bison	Bison	0.600	0.700	1.000	0.4200		-
	Other						-
Cervid	Elk	0.600	0.700	0.600	0.2520		-
	Deer	0.600	0.700	0.200	0.0840		-
	Other						-
Wild Boar	Feeders	2.000	0.800	0.140	0.2240		-
	Sow (farrowing)	2.000	0.800	0.371	0.5936		-
	Other						-
					Total		4,904.9

For New Operations

Dispersion Factor: 1

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	2,994	913
2	54.72	3,992	1,217
3	68.4	4,990	1,521
4	109.44	7,984	2,434

For Expanding Operations

Dispersion Factor: 1
Expansion Factor: 0.77

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	2,305	703
2	54.72	3,074	937
3	68.40	3,842	1,171
4	109.44	6,148	1,874

Name	Foothill Farms	
Address		0
Legal Land		
Location		0

Landbase Requirements (hectares) based on 2006 AOPA requirements

Category of Livestock	Type of Livestock	Number of Animals	Dark Brown & Brown (ha)	Grey Wooded (ha)	Black (ha)	Irrigated (ha)
Beef	Cows/Finishers (900+ lbs)	11000	1,375	1144	858	682
	Feeders (450 - 900 lbs)	0	0	0	0	0
	Feeder Calves (<550 lbs)	0	0	-	-	-
	Other	0				
Dairy (*count lactating cows only)	*Free Stall – Lactating Cows with all associated dries, heifers, and calves	0	0	0	0	0
	*Free Stall – Lactating cows with Dry Cows only	0	0	-	-	-
	Free Stall – Lactating Cows only	0	0	-	-	-
	Tie Stall – Lactating cows only	0	0	-	0	0
	Loose Housing – Lactating cows only	0	0	-	-	-
	Dry Cow (Solid manure)	0	0	-	-	-
	Dry Cow (Liquid manure)	0	0	-	-	-
	Replacements – Bred Heifers (Breeding to Calving)	0	0	-	-	-
	Replacements - Growing Heifers (350 lbs to breeding)	0	0	-	-	-
	Calves (< 350 lbs)	0	0	-	-	-
	Other	0				
Swine Liquid (*count sows only)	Farrow to finish *	0	0	0	-	-
	Farrow to wean *	0	0	-	-	-
	Farrow only *	0	0	-	-	-
	Feeders/Boars	0	0	0	0	0
	Growers/Roasters	0	0	-	-	-
	Weaners	0	0	-	-	-
	Other	0				
Swine Solid (*Count sows only)	Farrow to finish *	0	0	-	-	-
	Farrow to wean *	0	0	-	-	-
	Farrow only *	0	0	-	-	-
	Feeders/Boars	0	0	-	-	-
	Growers/Roasters	0	0	-	-	-
	Weaners	0	0	-	-	-
		0				
Poultry	Chicken - Breeders - Solid	0	0	-	-	-
	Chicken - Layers - Liquid (includes associated pullets)	0	0	0	0	0
	Chicken - Layers - (Belt Cage)	0	0	-	-	-
	Chicken - Layers - (Deep Pit)	0	0	-	-	-
	Chicken - Pullets/Broilers	0	0	0	0	0
	Turkey - Toms/Breeders	0	0	0	0	0
	Turkey - Hens (light)	0	0	-	-	-
	Turkey - Broilers	0	0	-	-	-
	Ducks	0	0	0	0	0
	Geese	0	0	0	0	0
	Other	0				
Horses	PMU	0	0	0	0	0
	Feeders > 750 lbs	0	0	0	-	-
	Foals < 750 lbs	0	0	-	-	-
	Mules	0	0	-	-	-
	Donkeys	0	0	-	-	-
	Other	0				
Sheep	Ewes/Rams	0	0	0	0	0
	Ewes with lambs	0	0	-	-	-
	Lambs	0	0	-	-	-
	Feeders	0	0	-	-	-
	Other	0				
Goats	Meat/Milk (per Ewe)	0	0	0	0	0
	Nannies/Billies	0	0	-	-	-
	Feeders	0	0	-	-	-
	Other	0				
Bison	Bison	0	0	0	0	0
	Other	0				
Cervid	Elk	0	0	0	0	0
	Deer	0	0	0	0	0
	Other	0				
Wild Boar	Feeders	0	0	0	0	0
	Sow (farrowing)	0	0	-	-	-
	Other	0				

Total Hectares	1,375	1144.0	858.0	682.0
Total Acres	3,398	2826.8	2120.1	1685.2

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): google earth

Margin of error (if applicable): +/- 3 m

Requirements (m): Category 1: 913 m Category 2: 1217 m Category 3: 1521 m Category 4: 2434 m

Technology factor: ☐ YES ☒ NO

Expansion factor: ☐ YES ☒ NO

MDS related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 3398 acres dry brown or 1685 irrigated

Land base listed: 1479 acres dry brown + 1275 acres irrigated

Area not suitable: already subtracted

Available area 1479 acres dry brown + 1275 acres irrigated Requirement met: ☒ YES ☐ NO

Land spreading agreements required: ☒ YES ☐ NO

Manure management plan: ☐ YES ☒ NO If yes, plan is attached: ☐

PLANS

Submitted and attached construction plans: ☒ YES ☐ NO

Submitted aerial photos: ☒ YES ☐ NO

Submitted photos: ☐ YES ☒ NO

GRANDFATHERING

Already completed: ☒ YES ☐ NO ☐ N/A

If already completed, see Approval LA10063

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

ALL SIGNATURES IN FILE ☒ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

August 13, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: July 30, 2025

Municipality: MD of Willow Creek

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Health Services: NA

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Alberta Environment and Parks: ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Transportation: ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Alberta Regulatory Services: ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Other: LNID ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

Other: ATCO gas and pipelines, South Alta Rural Electrification Association Ltd. ☐ N/A

☑ letter sent ☐ response received ☐ written/email ☐ verbal ☑ no comments received

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Naturally occurring protective layer

*(complete a copy of this section for **EACH** barn, feedlot, and storage facility for solid manure, composting materials, or compost with a naturally occurring protective layer for the liner)*

Facility description / name *(as indicated on site plan)*

1. Feedlot Pens
2. Solid Manure Pad

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	292	230	0	
2.	100	70	0	
			TOTAL CAPACITY	sufficient 9 mth storage capacity

☐ I plan to use a short-term solid manure storage (STMS) as part of my manure storage and handling plan for this CFO. (The AOPA requirements for STMS are set out in the NRCB Short-Term Solid Manure Storage Requirements Fact Sheet.

Surface water control systems

Describe the run-on and runoff control system

Runoff from these areas will be directed to the catch basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4.8 (m)	Provide details (as required) See attached hydraulic conductivity for clay equivalent calculations from John Lobbezoo Engineering and Consulting Services	
Soil texture	33 % sand	42 % silt	25 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested Borehole FF10-25 Screened length = 1.6 m	Hydraulic conductivity (cm/s) 3.3 x 10-7 cm/s	Describe test standard used In-situ hydraulic conductivity test

Additional information *(attach copies of soil test reports)*

Soil Investigation includes:
1) Soil sampling and borehole logs from Chilako Drilling
2) Geotechincal report from John Lobbezoo Engineering and Consulting Services

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO
Condition required: ☒ YES ☐ NO
Report attached: ☒ YES ☐ NO

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Naturally occurring protective layer (cont.)

NRCB USE ONLY

Nine month manure storage volume requirements met: ☒ YES ☐ YES With STMS ☐ NO

Depth to water table: 1.9 m blg (only in borehole 12. Will be built up to allow proper drainage) Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 4.27 m bgl (well 224510) worst case Requirements met: ☒ YES ☐ NO

ERST completed: ☒ see ERST page for details

Surface water control systems

Requirements met: ☒ YES ☐ NO Details/comments: Catch basin and berm around the south east corner to prevent any surface water from entering the coulee system (precautionary measure)

Naturally occurring protective layer details

Layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):

Low-medium to medium plastic silty clay loam overlaying clay loam with some silt lensing and sand streaks.

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a naturally occurring protective layer)*

Facility description / name *(as indicated on site plan)*

1. Catchbasin
2. _____
3. _____

Determination of runoff area

Provide a plan and show how you calculated the area contributing to runoff for each catch basin

See attached site map and area calculations

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)
1.	80	43	5	5	3:1	3:1	0	
2.	updated catch basin dimensions:							
3.	100	53	5	5	3:1	3:1		
							TOTAL CAPACITY	13,988 m^3

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	16 (m)	Provide details (as required) See attached hydraulic conductivity for clay equivalent calculations from John Lobbezoo Engineering and Consulting Services report	
Soil texture	30 % sand	39 % silt	31 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested Borehole FF15-25 Screened length = 3.3 m	Hydraulic conductivity (cm/s) 2.1 x 10-7 cm/s	Describe test standard used In-situ hydraulic conductivity test

Catch Basin – Design and management requirements can be found in Technical Guideline Agdex 096-101

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

Condition required: ☒ YES ☐ NO

Report attached: ☒ YES ☐ NO

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

*** Only cells in blue can be changed.**

Overall Dimensions of Catch Basin			Catch Basin Dimensions
Total Length*[4]	100.0	m	328 ft
Total Width*[4]	53.0	m	174 ft
Total Depth*[4]	5.0	m	16 ft
Design Capacity Depth	*4.50*	m	15 ft
End Slope*[4]	3	run:rise	3 run:rise
Side Slope*[4]	3	run:rise	3 run:rise
Length of Bottom	70.0	m	230 ft
Width of Bottom	23.0	m	75 ft
Capacity @ top of Bank	*16,525*	m^3	*Capacity (@tob) 583,575 ft^3 3,634,990 Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)
Length (design capacity depth)	97.0	m	318 ft
Width (design capacity depth)	50.0	m	164 ft
Total Depth	*5.0*	m	*16 ft*
Design Capacity Depth	4.50	m	15 ft
End Slope	3	run:rise	3 run:rise
Side Slope	3	run:rise	3 run:rise
Design Capacity (freeboard level)	**13,988**	m^3	493,990 ft^3
			3,076,984 Imp. Gal.
level)	*4,850*	m^2	*52,205 ft^2*

CFO Name [1]	(Enter CFO Name Here)
Land Location [1]	1-1-4-W5

Paved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
1			0.0
2			0.0
3			0.0
4			0.0
5			0.0
		Total Area (m^2)	**0**

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
6	288	77	22,176.0
7	292	76	22,250.4
8	292	76	22,250.4
9	153	157	24,021.0
10	142	293	41,606.0
		Total Area (m^2)	**132,304**

Rainfall (Select Town [3])

Fort Macleod 90

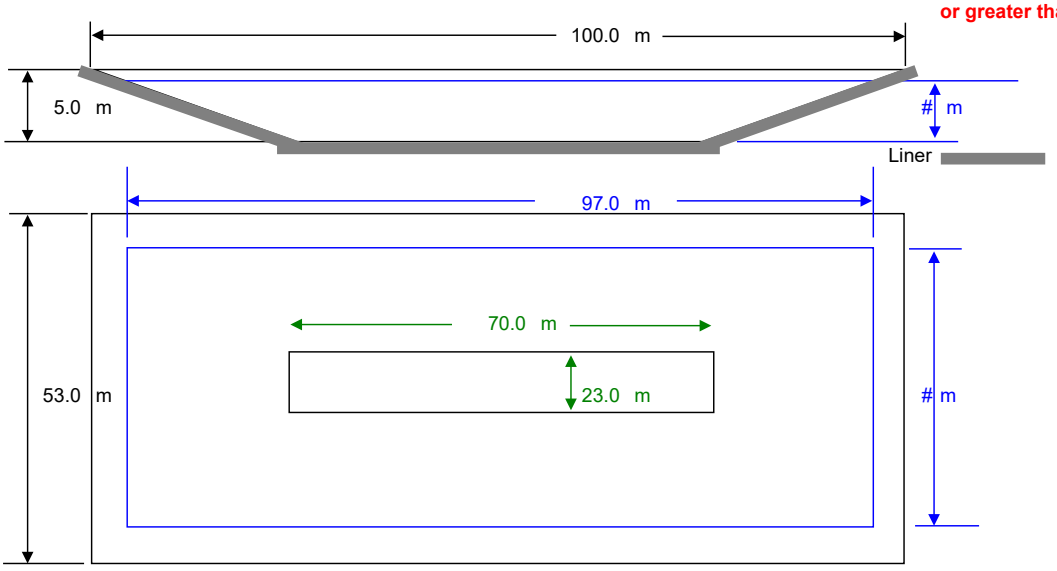
AOPA Design Rainfall **90 mm**

Minimum Catchbasin Storage Volume Required

7,740 m^3 ** 273327.48 ft^3

1702511.2 Imp. Gal.

**** Design capacity of catch basin should be equal to or greater than, minimum storage volume required.**



Lines in Black - Overall catch basin dimensions

Lines in Blue - Design capacity depth dimensions (excludes freeboard)

NTS - Not To Scale

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer (cont.)

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 13,988 m^3 Runoff capacity requirements met: [X] YES [ ] NO

Calculation of the volume attached: [X] YES [ ] NO

Depth to water table: below 8 m below ground level Requirements met: [X] YES [ ] NO

Depth to uppermost groundwater resource: below 8 m below ground level Requirements met: [X] YES [ ] NO

ERST completed: [X] See ERST page for details

Protective layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):

Leakage detection system required: [ ] YES [X] NO If yes, please explain.

Uniform layering of clay loam, stiff. Moist sand pockets below 8 m blg.

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

NRCB USE ONLY **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1	
Name / description **catch basin**	Capacity **13,899 m³**
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	**13,899 m³**
RUNOFF VOLUME FROM CONTRIBUTING AREAS	**7,740 m³**
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☒ YES ☐ NO

5 July 2025

J Lobbezoo Engineering & Consulting Services Ltd.
PO Box 96, Monarch, AB T0L1M0

JLECS File: P25024

Foothill Farms
c/o Linkage Ag Solutions
PO Box 1120
Coaldale, Alberta T1M 1M9

Attention: Mr. Cody Metheral, P.Eng.

Re: Geotechnical Review and Evaluation
NRCB Permitting of Proposed Pens and Catch Basin
SW-04-010-25-W4M, near Fort Macleod, Alberta

As requested, J Lobbezoo Engineering & Consulting Services Ltd. (JLECS) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes the site soil conditions to support a permit application related to a series of proposed feedlot pens and a catch basin, to be located generally east of the existing feedlot at the above-captioned quarter section (refer to Figure 1, attached).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, 13 boreholes were advanced at the site on February 26, 2025. The boreholes were advanced at the approximate locations denoted as FF1-25 to FF13-25 on Figure 1, attached. In May 2025 an additional three boreholes were advanced at the site in the area of the proposed catch basin. These additional borehole locations are denoted as FF14 to FF16 on Figure 1, attached.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 3.0 m to 9.0 m below the existing grade. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered in the boreholes consisted of up to 4 m of lacustrine clay and silty clay (with localize minor sand loam occurrences) overlying stiff low to medium plastic clay till. While minor perched groundwater (seepage) was noted at 5.7 m depth at borehole FF4-25 and at 2 m depth in borehole FF12-25, no groundwater resource (as defined by the AOPA) was encountered within the 9.0 m investigation depth at this site.

Samples of soil collected from the screened zones of boreholes FF2-25, FF7-25, FF10-25 and FF15-25 as well as samples from similar depths at the other boreholes were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The lab reports are attached, for reference. The results indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
FF1-25 / 7.0 – 9.0 m	32	42	26
FF2-25 / 2.0 – 3.0 m	26	56	18
FF2-25 / 7.0 – 9.0 m	34	42	24
FF3-25 / 2.5 – 3.0 m	32	44	24
FF4-25 / 7.0 – 9.0 m	34	42	24
FF5-25 / 2.0 – 3.0 m	35	41	24
FF6-25 / 2.0 – 3.0 m	34	50	16
FF7-25 / 2.4 – 3.4 m	41	38	21
FF8-25 / 2.0 – 3.0 m	36	42	22
FF10-25 / 2.4 – 3.4 m	33	42	25
FF11-25 / 2.5 – 3.0 m	38	42	20
FF12-25 / 2.0 – 3.0 m	40	36	24
FF13-25 / 7.0 – 9.0 m	31	40	29
Average (Pen Area)	*34*	*43*	*23*
FF14-25 / 6.0 – 7.5 m	35	38	27
FF15-25 / 6.0 – 7.5 m	30	39	31
FF16-25 / 6.0 – 7.5 m	33	36	31
Average (Catch Basin Area)	33	38	30

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes FF2-25 (pen area), FF7-25 (pen area), FF10-25 (pen area), and FF15-25 (catch basin area). Test well FF2-24 was screened from 5.7 m to 9.0 m depth, FF7-25 was screened from 2.0 m to 3.6 m depth, FF10-25 was screened from 2.3 m to 3.9 m depth, and FF15-26 was screened from 5.7 m to 9.0 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring wells to the top for several consecutive days. After several days of testing, the following 24-hour water drop were determined: 3.65 m drop at FF2-25; 2.10 m at FF7-25; 2.10 m at FF10-25; and a 24-hour water drop of 4.72 m was determined at FF15-25.

To calculate the permeability of the screened portion of the clay strata at the test well locations, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicate the following *in situ* hydraulic conductivity (k_s) values:

k_s = 1.3×10^{-8} cm/s at FF2-25 (northeast pen area);
k_s = 3.8×10^{-7} cm/s at FF7-25 (west pen area);
k_s = 3.3×10^{-7} cm/s at FF10-25 (southeast pen area); and
k_s = 2.1×10^{-7} cm/s at FF15-25 (proposed catch basin);

Using the measured permeability of the clay at this site, following equivalent thicknesses of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA) were determined:

- the 3.3 m of clay screened at test hole FF2-25 is estimated to represent the equivalent of 25 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s;
- the 1.6 m of clay screened at test hole FF7-25 is estimated to represent the equivalent of 4.2 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s;
- the 1.6 m of clay screened at test hole FF10-25 is estimated to represent the equivalent of 4.8 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s; and
- the 3.3 m of clay screened at test hole FF15-25 is estimated to represent the equivalent of 16 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s.

The above equivalent thicknesses represent natural material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c), and for catch basins at test holes FF2-25 and FF15-25 (minimum 5 m, Section 9.5-b).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and development at the site, it is JLECS's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the proposed pens and catch basin at this location.

Notwithstanding, it is noted that the localized occurrences of sandy loam soils were noted in the area of the proposed catch basin at test hole FF15-25. Any exposed sandy loam soils in the catch basin excavation would require removal from the side slopes and/or base area at the time of construction, and reconstruction of these pockets using low permeable clay soils would be required. The existing clay and clay till soils encountered are generally considered suitable for the side slope or base reconstruction.

We trust that this report satisfies your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

J Lobbezoo Engineering & Consulting Services Ltd.

PROFESSIONAL ENGINEER ALBERTA JOHN P. LOBBEZOO ID 110450 5 July 2025

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

PERMIT TO PRACTICE
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.
RM SIGNATURE:
RM APEGA ID #: 110450
DATE: 5 July 2025
PERMIT NUMBER: P016456
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments
Figure 1 Borehole Locations
In Situ Permeability Test Calculations
Down to Earth Soil Texture Results
Soil Profile and Parent Material Description, Chilako Drilling Services

Figure 1: Site Layout & Borehole Locations

Image Credit: Google

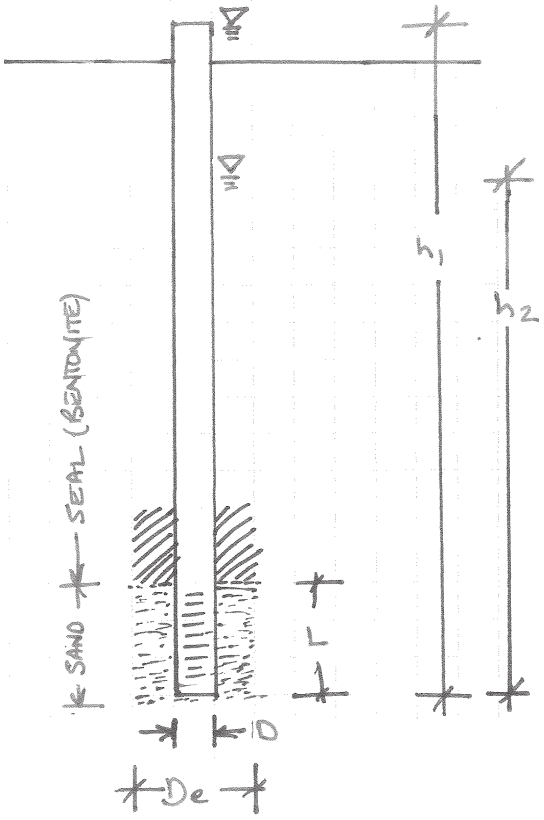
FF2-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



FF2-25 - Foothill Farms Ltd.

JLECS File: P25024

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	3.30	length of sand section (m)
h1	9.60	initial height of water above base of hole (m)
h2	6.25	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 1.3E-07 cm/sec

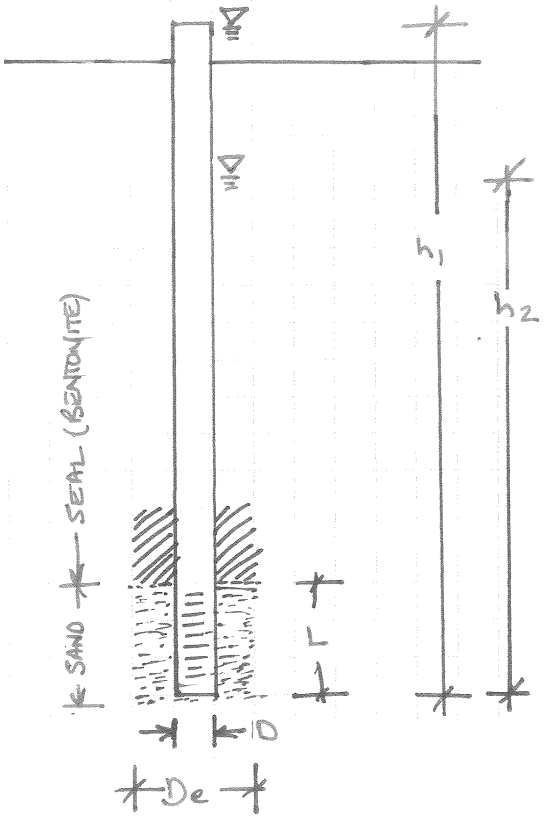
FF7-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



FF7-25 - Foothill Farms Ltd.

JLECS File: P25024

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.60	length of sand section (m)
h1	4.20	initial height of water above base of hole (m)
h2	2.10	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 3.8E-07 cm/sec

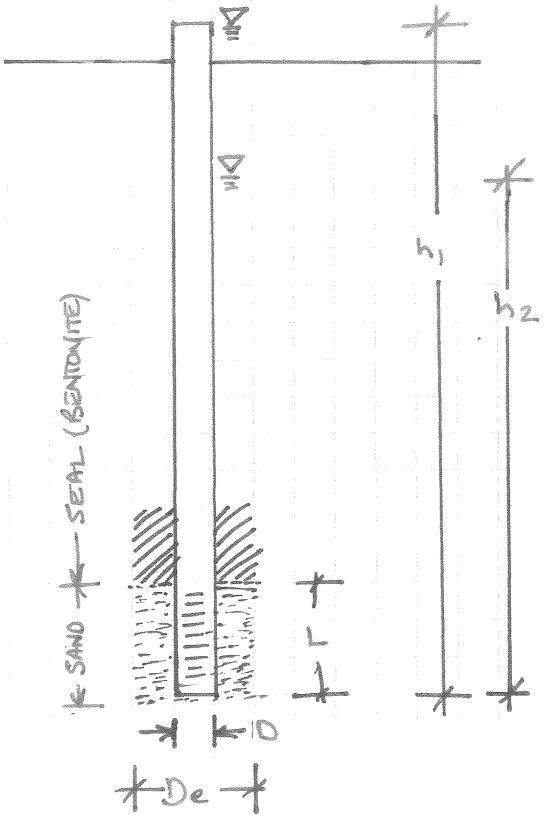
FF10-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



FF10-25 - Foothill Farms Ltd.

JLECS File: P25024

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.60	length of sand section (m)
h1	4.50	initial height of water above base of hole (m)
h2	2.40	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 3.3E-07 cm/sec

Dimensions confirmed
(See LA10063)

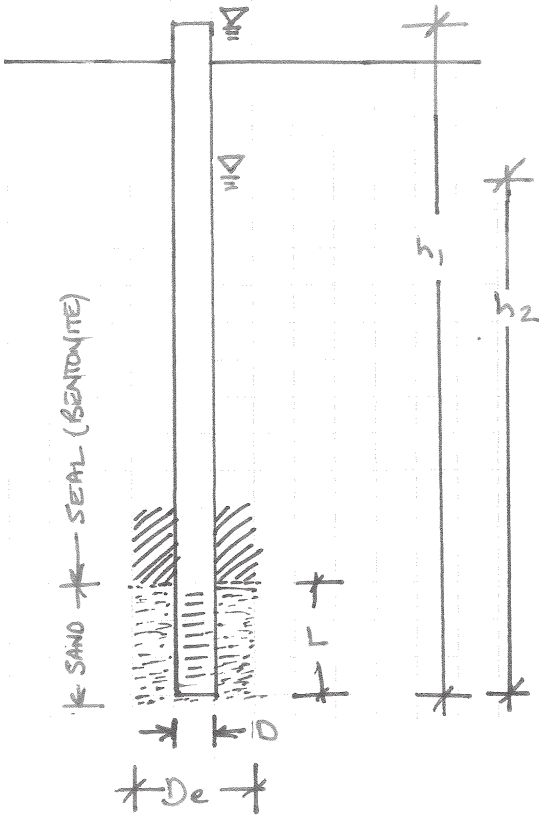
FF15-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



FF15-25 - Foothill Farms Ltd.

JLECS File: P25024

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	3.30	length of sand section (m)
h1	9.60	initial height of water above base of hole (m)
h2	4.88	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 2.1E-07 cm/sec

Down To Earth Labs Inc.
The Science of Higher Yields

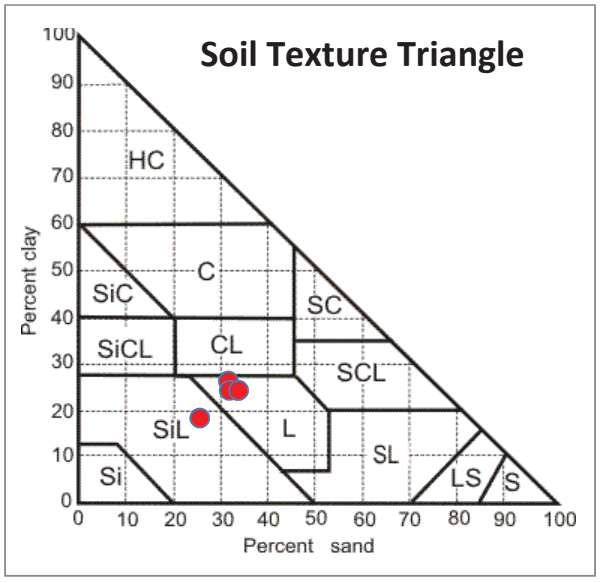
Linkage Ag Solutions
Box 1120
Coaldale, AB T1M 1M9

Report #: 205966
Report Date: 2025-06-05
Received: 2025-05-12
Completed: 2025-05-14
Test Done: ST

Project : Foothill Farms
PO:

3510 6th Ave North
Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

Analyte	Units	Sample ID: 250512L013 Cust. Sample ID: FF1 - 25 7-9m	250512L014 FF2 - 25 2-3m	250512L015 FF2 - 25 7-9m	250512L016 FF3 - 25 2.5-3m	250512L017 FF4 - 25 7-9m
Sand	%	31.8	25.7	33.8	32.0	34.0
Silt	%	42.2	56.3	42.2	44.0	42.0
Clay	%	26.0	18.0	24.0	24.0	24.0
Soil Texture	-	Loam	Silt Loam	Loam	Loam	Loam



Down To Earth Labs Inc.
The Science of Higher Yields

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Box 1120
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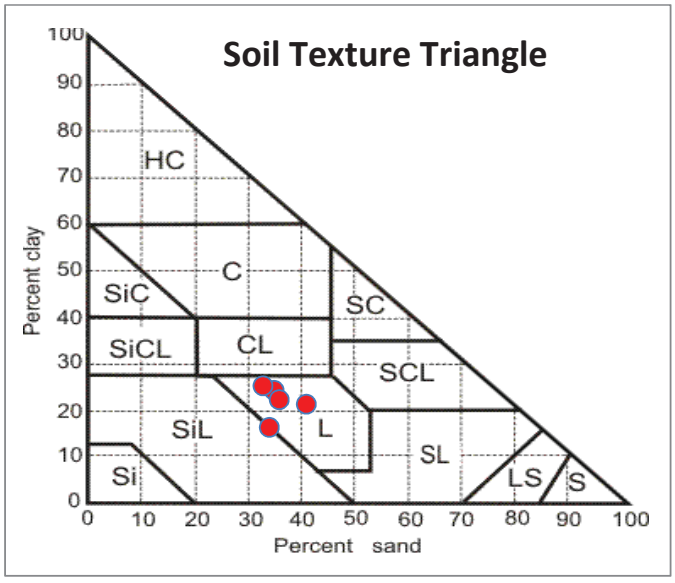
PO:

3510 6th Ave North
Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

Analyte	Units	Sample ID: 250512L018	250512L019	250512L020	250512L021	250512L022
		Cust. Sample ID: FF5 - 25	FF6 - 25	FF7 - 25	FF8 - 25	FF10 - 25
		2-3m	2-3m	2.4-3.4m	2-3m	2.4-3.4m
Sand	%	35.0	34.1	41.1	36.0	32.9
Silt	%	41.0	49.9	37.9	42.0	42.1
Clay	%	24.0	16.0	21.0	22.0	25.0
Soil Texture	-	Loam	Loam	Loam	Loam	Loam



Down To Earth Labs Inc.
The Science of Higher Yields

Linkage Ag Solutions
Box 1120
Coaldale, AB T1M 1M9

Report #: 205966
Report Date: 2025-06-05
Received: 2025-05-12
Completed: 2025-05-14
Test Done: ST

Project : Foothill Farms
PO:

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Lethbridge, AB T1H 5C3
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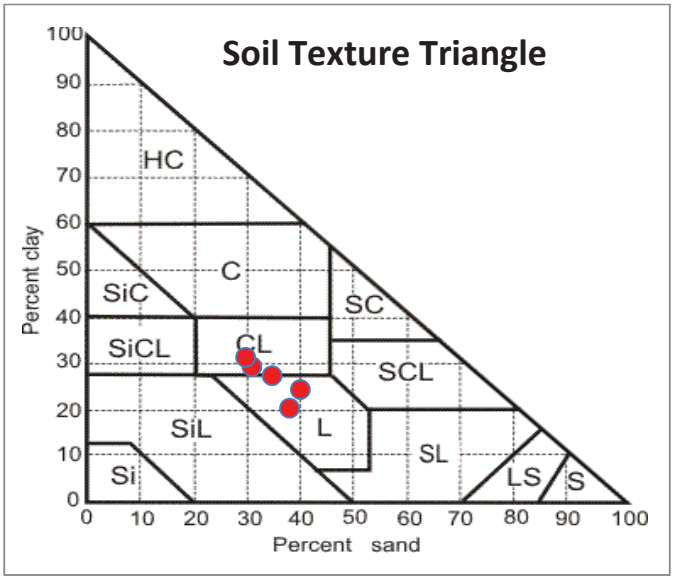
Analyte	Units	Sample ID: 250512L023	250512L024	250512L025	250602L008	250602L009
		Cust. Sample ID: FF11 - 25	FF12 - 25	FF13 - 25	FF14-25	FF15-25
		2.5-3m	2-3m	7-9m	6.0-7.5	6.0-7.5
Sand	%	38.1	40.1	31.0	34.8	29.8
Silt	%	41.9	35.9	40.0	38.2	39.2
Clay	%	20.0	24.0	29.0	27.0	31.0
Soil Texture	-	Loam	Loam	Clay Loam	Clay Loam	Clay Loam



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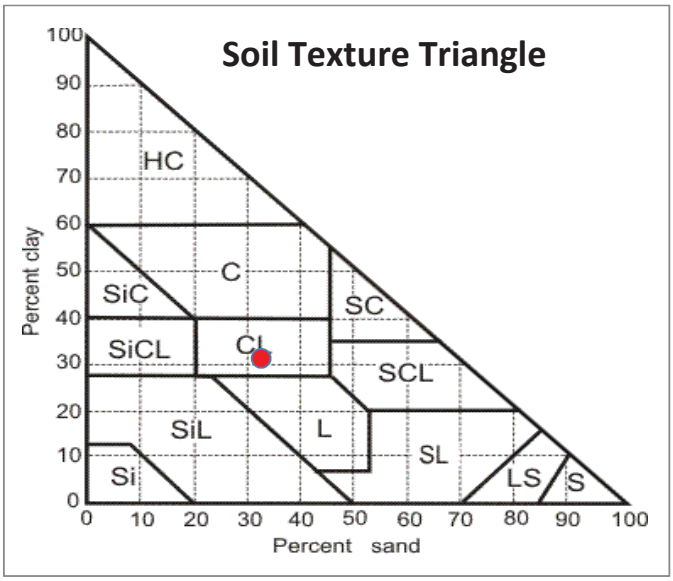
		Sample ID:	250602L010
		Cust. Sample ID:	FF16-25
Analyte	**Units**		6.0-7.5
Sand	%		32.8
Silt	%		36.2
Clay	%		31.0
Soil Texture	-		Clay Loam



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

Box 942 Coaldale, Alberta, T1M 1M8
(403) 345-3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: SW4-10-25W4, Foothill Farms Date: 26-Feb-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
FF1-25	0332128	0-0.4	CL	F	Lac		
	5518212	0.4-4.1	SiCL	SM	Lac	3.0-4.0	
		4.1-4.6	CL-C	SM	Till		Stiff, med plastic, olive brown
		4.6-5.2	FSL	SM	Till	4.6-5.2	Slight seepage @ 5.2m
		5.2-9.2	C	SM	Till	7.0-9.0	Stiff, med plastic, olive brown, oxidized, silt lensing
FF2-25	0332081	0-0.6	CL-SiCL	F	Lac		
	5518231	0.6-1.1	SiCL	SM	Lac		
		1.1-1.5	CL	SM	Lac		
		1.5-3.0	SiCL	SM	Lac	2.0-3.0	
		3.0-7.0	CL-C	SM	Till		Stiff, low-med plastic, olive brown, silt lensing
		7.0-9.0	CL-C	SM	TIll	7.0-9.0	Stiff, low-med plastic, olive brown, silt lensing, oxidized
							50mm H.C. Well installed to 9.0m BGS
							Screen: 9.0-6.0m
							Sand: 9.0-5.7m
							Bentonite: 5.7-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
FF3-25	0332084	0-0.8	CL	F	Lac		
	5518175	0.8-2.4	SiCL	SM	Lac		
		2.4-4.5	CL	SM	Till	2.5-3.0	Stiff, low-med plastic, olive brown
		4.5-6.4	CL-C	SM	Till		Stiff, low-med plastic, olive brown, silt lensing
		6.4-6.7	SiCL	SM	Till		
		6.7-9.0	CL-C	SM	Till		Stiff, low-med plastic, olive brown, silt lensing
FF4-25	0332130	0-0.5	SiCL	F	Lac		
	5518174	0.5-1.7	CL	SM	Lac		
		1.7-4.0	SiCL	SM	Lac	2.0-3.0	Silt lensing
		4.0-6.3	CL	SM	Till		Stiff, low-med plastic, olive brown, sand streaks
		6.3-7.0	SiCL	SM	Till		
		7.0-9.0	CL-C	SM	Till	7.0-9.0	Stiff, low-med plastic, olive brown
							minor seepage @ 5.7m
FF5-25	0331979	0-0.7	SiCL	F	Lac		
	5518230	0.7-3.0	CL	SM	Till	2.0-3.0	Stiff, low-med plastic, olive brown, silt lensing
FF6-25	0331867	0-0.7	SiCL	F	Lac		
	5518234	0.7-1.6	CL	SM	Till		
		1.6-3.0	SiCL	M	Till	2.0-3.0	
FF7-25	0331850	0-0.6	SCL	F	Lac		
	5518138	0.6-1.6	SCL	SM	Lac		
		1.6-3.6	CL	SM	Till	2.4-3.4	Stiff, low-med plastic, brown
							50mm H.C. Well installed to 3.6m BGS
							Screen: 3.6-2.1m
							Sand: 3.6-2.0m
							Bentonite: 2.0-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (CONTINUED)

Site Location: SW4-10-25W4, Foothill Farms Date: 26-Feb-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
FF8-25	0331951	0-0.7	SCL	F	Lac		
	5518139	0.7-3.0	CL	SM	Till	2.0-3.0	Stiff, low-med plastic, olive brown
FF9-25	0332052	0-0.6	SCL	F	Lac		
	5518140	0.6-3.0	CL	SM	Till	2.0-3.0	Stiff, low-med plastic, brown
FF10-25	0332042	0-0.4	CL	F	Lac		
	5518040	0.4-1.2	SCL	SM	Lac		
		1.2-3.9	CL	SM	Till	2.4-3.4	Stiff, med plastic, brown, silt lensing
							50mm H.C. Well installed to 3.9m BGS
							Screen: 3.9-2.4m
							Sand: 3.9-2.3m
							Bentonite: 2.3-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
FF11-25	0331941	0-0.8	FSL-FSCL	F	Lac		
	5518043	0.8-3.0	CL	SM	Till	2.5-3.0	Stiff, low-med plastic, brown
FF12-25	0331863	0-0.5	SiCL	F	Lac		
	5518008	0.5-1.9	CL	SM	Till		
		1.9-2.4	FSL	Sat	Till		Free water
		2.4-3.0	CL	M	Till	2.0-3.0	Stiff, low-med plastic, brown
FF13-25	0332098	0-0.5	CL	F	Lac		
	5518285	0.5-1.6	CL	SM	Lac		
		1.6-3.4	SiCL	SM	Lac		
		3.4-9.2	CL-C	SM	Till	7.0-9.0	Stiff, low-med plastic, olive brown, silt lensing
FF14-25	0332039	0-0.15	CL	D	Topsoil		
	5517968	0.15-0.4	CL	D	Till		Some gravel
		0.4-1.7	CL	D	Till		Stiff, med plastic, brown
		1.7-4.2	CL	M	Till		Stiff, med plastic, brown
		4.2-9.0	CL	M	Till	6.0-7.5	Stiff, med plastic, brown, some oxidation
							Moist sand pockets @ 8.0-9.0m
FF15-25	0332000	0-0.15	FSL	D	Topsoil		
	5517986	0.15-0.7	FSL	D	Lac		
		0.7-2.6	CL	M	Till		V. Firm-stiff, low-med plastic, brown, some sand pockets
		2.6-9.0	CL	M	Till	6.0-7.5	Stiff, med plastic, brown
							50mm H.C. Well installed to 9.0m BGS
							Screen: 9.0-6.0m
							Sand: 9.0-5.7m
							Bentonite: 5.7-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
FF16-25	0331998	0-0.15	CL	D	Topsoil		
	5517935	0.15-1.4	CL	D	Till		
		1.4-1.6	CL	M	Till		Stiff, med plastic, brown
		1.6-2.8	CL	M	Till		V.firm, low-med plastic, brown, sand pockets
		2.8-9.0	CL	M	Till	6.0-7.5	Stiff, med plastic, brown

Legend:

L	Loam
C	Clay
S	Sand
Gr.	Gravel
Si	Silt
F	Fine (sand)
VF	Very Fine (sand)


ur map.
Foothill Farms Feedlot
FF13-25
FF6-25
FF5-25
FF2-25
FF1-25
FF3-25
FF4-25
FF7-25
FF8-25
FF9-25
FF11-25
FF10-25
FF12-25
FF15-25
FF14-25
FF16-25